

NOTE: Visual inspection is critical in this unit!
The upright position of many of the components used on the board can create problems. It is possible for them to be shorted to the shield or to each other. Make sure they are evenly spaced and do not contact the shield.

Areas of the PCB particularly vulnerable to this problem are:

Bottom right corner - caps
Bottom center - J1-J6
Bottom left - Q3 shorted to FB57
Top left - ferrite beads
Center - Twisted caps (just outside of RF can)

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1) NO VIDEO - Absolutely no video on screen
 A) Check for 5 volts
 O.K. If not: 1) Check fuse
 2) Check for twisted or bent caps
 (5 V. short to ground)
 3) Check L1
 +
 B) Check for oscillation at pin 14 of U1
 O.K. If not: 1) Check for good connection at
 pin 14 of U1
 + 2) Check for good connection at
 R1 thru R7
 C) Check for LUM signal at pin 23 of U1, at pin 4 of
 the modulator, at pin 8 of the modulator, at FB3 and
 at pin1 of CN7
 O.K. If not; 1) Check for LUM signal shorted
 to ground
 2) Check for open traces
 3) Check modulator
 D) Check for reset
 O.K.
 E) Check for control signals:

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| Signal | I.C. | Pi | Signal | I.C. | Pin |
|--------|------|----|--------|------|-----|
| AEC    | U1   | 35 | R/W    | U1   | 7   |
| AEC    | U2   | 4  | 0      | U1   | 12  |
| CAS    | U1   | 11 | MUX    | U1   | 9   |
| CS1    | U1   | 6  | IRQ    | U1   | 8   |
| CS1    | U20  | 15 | RDY    | U2   | 2   |
| CS0    | U1   | 5  | BA     | U1   | 34  |
| CS0    | U20  | 1  | RAS    | U1   | 10  |

2) BAD VIDEO - Scrolling lines on screen -  
Random blocks on screen - Blurred display

- A) Check J1-J6 for shorts to ground or each other O.K.
- B) Check reset for correct operation O.K.
- C) Check U1 for proper operation  
O.K. If not: 1) Check socket for good solder  
2) Check for bad
- U1 D) Check U2 for proper operation  
O.K. If not: 1) Check socket  
+ 2) Check for bad U2
- E) Check RAM data lines for correct amplitude  
O.K. If not: 1) Check for hot surface of RAM  
2) Jump out RAM to verify
- F) Check multiplexers U9, U10 - signals at RP3 and RP4 should be similar in frequency and amplitude  
O.K. If not: 1) Suspect U9 or U10 +
- G) Check ROM for chip select signal at pin 22 of U23 and U24  
O.K. If not; 1) Check for signal generation  
+ at U20
- H) Check that all ROM addresses are present and correct amplitude  
O.K. If not: 1) Trace problem address AO-A15
- I) Check U19, U23, U24 by replacement with known good

3) NO POWER

- A) Verify voltage +5 and +9 volts
  - 1) Check for shorts to ground
  - 2) Check switch
  - 3) Check power supply

4) BAD BASIC - Random characters on screen - Random colors - Power-up message is missing

- A) Check Basic ROM U23
- B) Check B thru I above (Bad Video)

## 5) NO COLOR or BAD COLOR

- A) Check U1 pin 14 for 14.31818 MHz with frequency counter  
O.K. If not: 1) Check solder joints of CT1  
• and adjust for correct frequency 2) Check crystal, Q1 and Q2 3) Check clock circuit for opens or shorts
- B) Check U1 pin 13 for Color Out signal.  
O.K. If not: 1) Swap U1 w/known good
- C) Check modulator M1 pin 5 for Color In signal and pin 6 for Color Out signal  
O.K. . If not: 1) Check M1 operation
- D) Check FB4 and CN7 pin 6 to see if color signal is present. Check for shorts

## 6) NO SOUND or BAD SOUND

- A) Check U1 pin 33 for SND signal  
O.K. if not: 1) Check socket for open circuit  
• 2) Swap U1 w/known good
- B) Check audio circuit for short to ground or loss of signal.  
O.K. If not: 1) Check Q3 - Be sure emitter and base + are not shorted to 5 V.
- C) Check modulator M1 pin 2 for SND signal
  - 1) Adjust I.F. can (top right of modulator) for clean, loud volume
  - 2) M1 pin 2 to ground should read approximately 480 ohms
  - 3) Check M1 for component failure

## 7) SERIAL

## FAILURES

- A) Check FB23-26 for shorts to shield or each other B) Check U7, U2 and CN2

## 8) KEYBOARD FAILURES

- A) Check pins on ribbon cable for good connection  
O.K.
- B) Check for shorts - CN5, CN6, FB's, Diodes  
O.K.  
+
- C) Check chip select to U27 and the I.C. U27  
O.K.  
+
- D) Check U1 for proper operation  
O.K. If not: 1) Check socket  
+ 2) Check for bad U1

## 9) FAILURES IN SOFTWARE MODE - All units should be checked for proper operation, when any repairs are necessary. To Check:

- 1) Press 'F1' on keyboard
  - 2) Press 'Return' to enter Word Processing mode
  - 3) Press 'Commodore' key and 'C' key at the same time
  - 4) Type 'tc' and press 'Return' to enter Spreadsheet
  - 5) Press 'Commodore' key and 'C' key again
  - 6) Type 'tw' to return to Word Processing mode

Watch for video or loading problems, then:

- A) Check jumpers at J1-J6 for correct connection  
O.K.
- B) Check U1, U2, U25, U26